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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,246	12/05/2006	Joachim Rudhard	10191/4346	6203

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EXAMINER	
KUSUMAKAR, KAREN M	
ART UNIT	PAPER NUMBER
2829	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/571,246	RUDHARD, JOACHIM	
	Examiner	Art Unit	
	KAREN M. KUSUMAKAR	2829	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *01 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9-11 and 14-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9-11 and 14-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. The request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission, filed on 3/1/10 is accepted.

Status of Claims

2. As of the amendment filed 3/1/10, no claims have been added, claims 1-8 and 12-13 have been canceled, and claims 9 and 16 have been amended. Therefore, claims 9-11 and 14-18 remain pending, with claim 9 and 16 being independent.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the use of the germanium-containing layer as a functional layer/flat diaphragm (claims 14 and 16) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because it does not explain the problem to be solved with the invention. It is very unclear how the Ge-containing layer is both simultaneously removed and yet also used as a functional component layer. Page 4, lines 5-10 give an example of a diaphragm. It says the Ge-layer is used as a diaphragm (i.e. it is the diaphragm, not just containing a diaphragm) that rises from etching the layers around it. Yet if one etches the layers around it and then proceeds to completely remove the Ge layer, how is a diaphragm left over? A drawing showing this would be very beneficial.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 14 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As discussed above, it is unclear how a layer containing functional components can be simultaneously a functional component layer and/or a flat diaphragm and yet be completely removed. If the layer is a functional component layer then it can't be removed. In looking to the disclosure in order to understand the invention and advance prosecution, fig. 5 appears to be the most clear. That is, the Ge layer is being used as a functional layer and therefore cannot be removed. In order to advance prosecution, Examiner is going to look to Fig. 5.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by ***Bashir et al. (US 5,888,845).***

As to claims 16 and 17, Bashir teaches a diaphragm sensor unit (see abstract) comprising: a substrate (200, Fig. 2) made of one of silicon and a layered silicon/insulator structure (col. 3:6-10); and a flat diaphragm (diaphragm 210, Fig. 13) containing germanium (col. 3:52-56) for implementing a sensor element structure for a sensor, wherein at least one of a germanium and

germanium-containing layer is simultaneously used as a component functional layer (the diaphragm is a functional component, col. 4:11-13, and is even cited as an example of a functional component by Applicant, p. 4, 2nd para. of instant application) and is situated in the layered structure (Fig. 4, the substrate 200, the oxide 204, and the diaphragm 210 are layered).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 9-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over ***Tejwani et al. (US 5,310,451).***

As to claims 9-11, Tejwani teaches a method comprising applying at least one of a germanium-containing layer and a germanium layer (20, col. 5:60-63) to a back of a silicon wafer (10, col. 4:55-57) at a point at which or in whose surroundings an etching procedure is to be completed (Fig. 2, col. 7:44-50); detecting at least one of germanium and germanium compounds during the etching procedure and controlling the etching procedure as a function of the detection (col. 8:6-14, the germanium-containing layer is used as an etch stop, therefore it is obvious if not inherent that there is some sort of control and detection process which stops/interrupts the etching when the germanium-

containing layer is reached); and completely removing at least one of the germanium and germanium-containing layer after completion of an etching procedure up to at least one of the germanium and germanium-containing layer (col. 8:42-47), wherein the at least one of the germanium and germanium-containing layer is buried in a layered structure (Fig. 1).

It is noted that the preamble of the claim does not impart functionality to the claim and is, therefore, not being given patentable weight.

11. Claims 9 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Tillack*** in view of ***Partridge et al. (US 2004/0245586).***

As to claim 9, Tillack teaches a method for producing at least one of (a) etched holes and (b) etched trenches of a component based on one of (c) silicon and (d) a layered silicon/insulator structure (See abstract), the method comprising: applying at least one of a germanium-containing layer and a germanium layer to a back of a silicon wafer at a point at which or in whose surroundings an etching procedure is to be completed (page. 104, section B, first paragraph); detecting at least one of germanium and germanium compounds during the etching procedure (page 104, column 2, lines 11-17); and controlling the etching procedure as a function of the detection (page 105, section IV).

Tillack does not explicitly teach removing at least one of the germanium and germanium-containing layer after completion of an etching procedure up to at least one of the germanium and germanium-containing layer. Tillack teaches a

method for non-invasively monitoring the etching process but is silent on what the next step is after etching. Partridge teaches removing at least one of the germanium and germanium-containing layer after completion of an etching procedure up to at least one of the germanium and germanium-containing layer (page 1, [0058], Fig. 6C-6E).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the etching procedure of Tillack in the MEMS device fabrication process of Partridge so as to have a more sensitive and accurate indicator of when to stop etching (Tillack, page 105, Part IV, second to last sentence).

As to claim 14, Tillack in view of Partridge further teach all the limitations of claim 9 but do not explicitly teach at least one of the germanium and germanium-containing layer is simultaneously used as a component functional layer (page 1, [0058], Fig. 6C-6E, layer 32 contains mechanical elements 20a-d).

12. Claim 15 is rejected under 35 U.S.C. 103(a) as obvious over ***Tejwani et al. (US 5,310,451),*** as applied to claim 9, in view of ***Tillack et al. (Applicant's admitted prior art filed in IDS dated 9/11/08).***

As to claim 15, Tejwani teaches all the limitations of claim 9 but does not explicitly teach the at least one of germanium and germanium compounds is detected using one of optical emission spectroscopy and mass spectroscopy. However, Tillack teaches the at least one of germanium and germanium

compounds is detected using one of optical emission spectroscopy and mass spectroscopy (page 103, first column, last paragraph of Part B). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use one of optical emission spectroscopy and mass spectroscopy to detect the germanium as taught by Tillack so as to improve the accuracy of the etch.

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Bashir*** in view of ***Shimada et al. (US 4/986,127).***

As to claim 18, Bashir teaches all the limitations of claim 16 but does not explicitly teach the flat diaphragm is made entirely of germanium. However, Bashir does teach that altering the content of germanium permits customization of the diaphragm's responsivity properties (col. 4:11-17) and Shimada teaches a flat diaphragm made entirely of germanium (col. 10:18-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the diaphragm entirely of germanium as taught by Shimada so as to customize the diaphragm's responsivity properties to meet product and customer specifications.

Response to Arguments

14. Applicant's arguments with respect to claims 9-11 and 14-18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Godbey (US 5,413,679) and Yao et al. (US 6,614,657) teach methods for producing MEMs.

16. Any response to this Office Action should be faxed to (571) 273-8300 or mailed to:

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Hand-Delivered responses should be brought to:

Customer Service Window

Randolph Building

401 Dulany Street

Alexandria, VA 22313

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAREN M. KUSUMAKAR whose telephone number is (571) 270-3520. The examiner can normally be reached on Mon - Thurs 7:30a - 5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ha Nguyen can be reached on 571-272-1678. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. M. K./
Examiner, Art Unit 2829
3/13/2010

/Ha T. Nguyen/
Supervisory Patent Examiner, Art Unit 2829